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Stephen Gorard
Nadia Siddiqui
Vikki Boliver

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An analysis of contextual and other indicators of HE students for possible use in widening participation

Stephen Gorard, Nadia Siddiqui, and Vikki Boliver
Durham University
s.a.c.gorard@durham.ac.uk

Abstract

This paper looks at the HESA statistics for all students at university at HEIs in England from 2008/9 to 2011/12, linked to the National Pupil Database (NPD), with records for all pupils in England who ended Key Stage 4 (KS4) in 2006.This limits the analysis only to those eventually continuing to HE but not among the 7% who attended a private school (and these two limitations must be borne in mind throughout). Where a young person is obviously disadvantaged, this can be taken into account in contextualised admissions to HE. Of the indicators currently available in the generic HESA data, which give the most accurate assessment of that context – singly or in combination? This paper looks at missing data, and what is known about students for whom data is missing. It looks at changes in indicators of potential disadvantage over a student's lifetime at school and beyond. And it looks at the relationship between all indicators and student attainment and progress at school and beyond.

Most of the potentially useful or interesting variables in this HESA dataset are so incomplete as to be useless for the purposes of contextualised admissions. Only occupational class, parental education and POLAR quintile of residence have sufficient coverage to consider in detail here. Other indicators such as sex and ethnicity are best used via the linked NPD dataset. Occupational class and parental education are only known for that subset of students in each age cohort applying for HE, and this distorts the picture. For example, of students attending HE, Black students are most likely to have parents with HE, and so any attempt to use parental education as a contextual indicator could be counter-productive. Around 20% or more of HE students have unknown occupational class or parental education, and this also distorts the picture. In general, NPD data on all students is fuller and better quality. The only indicator in the HEAS dataset used here that is worth pursuing further is POLAR, which could be available for all of each school cohort, and has the least missing data.

However, there is not much difference in the qualified HE participation rates by POLAR (or occupational group, or parental education). Ethnic minority (of all categories) and EAL students are considerably over-represented in HE, while males and those living in care are under-represented.
Poor students and those living in poorer areas appear to participate in almost direct proportion to their earlier qualifications. Students are then gaining HE results in proportion to their prior attainment, and largely unrelated to their background once these qualifications are taken into account. Finer-grained analysis by individual HEI and subject is not really possible because of the small cell sizes. Some aggregation is necessary. There are clear differences in the prior attainment levels of students attending different types of HEI, and this difference in attainment is reflected in the type of students attending – with fewer poor students or those living in care in Russell Group Universities.

Introduction

Student intakes to universities in the UK are stratified by socio-economic and other characteristics (Gorard et al. 2007). Students from less advantaged social and economic backgrounds are generally under-represented, especially in the UK's most selective universities and in some subjects leading to professions (Broecke 2015). In response to this, an increasing number of universities are using contextual data about prospective students' socioeconomic and educational circumstances to inform admission decision-making (Universities Scotland 2016), in the same way that such data has long been used to understand pupil attainment in studies of school performance and improvement (Gorard

2000, 2010). The key issue is to know which indicators are available and appropriate to use for this purpose.

The paper looks at those indicators that could be used from those available in HESA statistics, and which can be linked to the National Pupil Database (NPD) for England. The paper provides a summary of the simple comparative methods used, before presenting the tabulated results for each possible indicator, and then summarising the implications for contextualised admissions. It is a continuation of the work on the NPD indicators themselves, as covered in Gorard et al. (2017).

Methods

Datasets

The analyses in this paper are based on the HESA records for students at HEIs in England from 2008/9 to 2011/12, linked to the National Pupil Database (NPD), with records for all pupils in England who ended Key Stage 4 (KS4) in 2006. The linkage means that this paper is chiefly about the 93% of one pupil cohort from state-maintained schools and colleges in England.

The possible variables for use with contextualised admissions here concern the area of residence (IDACI score and POLAR quintile), family SES (FSM-eligibility, parental occupational class, parental education), and individual characteristics of each student (such as sex, first language, ethnicity, and SEN status). These are linked to each other, and to participation, type of HEI (university) attended, and eventual degree outcomes in higher education (HE).

There are around 200,000 students from the 2006 KS4 cohort who attended HE by 2012, but not all of these have data for every variable – for example, not all of them completed their degree in the same period. More precise numbers are given in every descriptive analysis,

Analyses

Each possible context variable is considered in terms of its missing data, its links to all other potential context variables, and to variables representing attainment and progress at KS3, KS4 and KS5, attendance and degree outcome in HE, and type of HEI attended. Real numbers are compared to categories by comparing means, and categorical variables are cross-tabulated.

The Key Stage 5 (post-compulsory) attainment data is considered in terms of who stays on in education after the age of 16, who attains the equivalent of EE or better at A-level (QCA 300 points), who enters HE, and who attains a first or 2.1 class degree (where relevant). A regression model is created for each stage of progression from KS5 to degree outcome, to estimate the possible impact of contextual variables after prior attainment has been accounted for.

HESA variables

The quality and completeness of most variables in the HESA data are considerably worse than for the equivalent students in the NPD dataset. Indicators of student sex, disability, ethnicity and all other variables that it is possible to compare directly with NPD are confused and have considerable missing data. For example, Table 1 cross-references the ethnicity records for all students at school in 2006 and a subset of these same students when in HE. Of 594,762 at school, a total of 392,332 do not appear in the HE data, leaving 202,420. Of these, only 188,735 (93%) have a known ethnicity that is compatible across the two measures, and 12% of HE students have unknown or unrecorded ethnicity from one source or other. Therefore, the NPD version of all repeated variables is used where possible in this paper (and these are covered in more detail in Gorard et al. 2017).

Table 1 - Number of students of each ethnicity recorded at KS4 and in HE, 2006 KS4 cohort, England

	White HE	Asian HE	Black HE	Other/mixed HE	Not known HE	Not in HE	Total
White 2006	151,883	357	220	2,220	1,437	343,239	499,356
Asian 2006	69	20,295	54	586	390	16,179	37,573
Black 2006	59	61	9,704	633	195	11,336	21,988
Chinese 2006	8	1,627	1	34	26	557	2,253
Mixed	593	281	319	4,058	109	8,033	13,393
Other	329	931	97	1,134	99	2,466	5,056
Unclassified	3,524	325	223	382	167	10,522	15,143
Total	156,465	23,887	10,618	9,047	2,423	392,332	594,762

The KS4 category Chinese does not appear in the HESA data, and is ignored in assessing volatility

Similarly, several of the variables appearing only in the HESA dataset have so much missing data that they cannot be used. Around half are missing mode and level of degree, for example. The three additional context variables with around 80% completion used here are parents' occupational group (seven classes plus never worked and missing), parental higher education, and POLAR quintile. However, even these variables have missing values for a high proportion of cases. There are 202,430 cases attending HE. Of these, 360 are listed as coming from families having no occupational class (never worked), 37,518 are listed as 'unclassified', and a further 2,528 are simply missing. This means that 20% of students in HE have no value for occupational class – more cases than for seven out of the eight actual classifications. For parental education, 17,242 are listed as don't know, and 24,602 as refused. This is 21% of the total. Only 350 students (0.2%) are missing a POLAR value. Each of these variables is considered in more detail below.

Occupational class

It is well-established that attainment at school is linked to SES. However, those students who continue to HE have roughly the same level of attaining 5+ GCSEs or equivalent including English and maths (the standard level 2 threshold), irrespective of their occupational class (Table 2). Similarly, given that the number of cases in some cells is small, so creating some sensitivity, there is relatively little pattern by social class in terms of some other indicators of potential disadvantage – including SEN with statement of need. It is perhaps those unclassified by occupation (missing) who are most disadvantaged in other terms – being more likely to be in care, FSM-eligible, ethnic minority, EAL, and SEN. They are also least likely to reach the level 2 threshold of qualification at KS4 – usually necessary to proceed in sixth form study. There are clear links between occupational class, parental education and living in a low participation neighbourhood.

Table 2 – Percentage of HE students of each occupational class with other characteristics, 2006 KS4 cohort, England

	Higher managerial & professional	Lower managerial & professional	Intermediate occupations	Small employers & own account workers	Lower supervisory & technical	Semi-routine occupations	Routine occupations	Never worked & long-term unemployed	Not classified
Living in care	4.8	15.6	4.5	5.7	2.3	18.1	4.8	0.2	44.0
Not in care	17.9	24.8	11.2	6.6	4.5	11.1	5.0	0.2	18.5
FSM-eligible	3.8	10.0	5.6	6.3	2.3	17.0	9.1	1.2	44.6
Not FSM	19.1	26.0	11.7	6.6	4.7	10.7	4.7	0.1	16.4
Male	18.5	24.9	11.1	6.6	4.4	10.7	4.7	0.2	18.9
Female	17.4	24.7	11.3	6.6	4.6	11.6	5.3	0.2	18.2
White	19.7	26.2	11.8	6.2	5.1	10.1	4.8	0.1	16.0
Asian	9.9	15.2	8.6	11.6	3.0	15.2	7.8	0.4	28.5
Black	9.0	25.6	10.7	3.0	2.0	14.8	4.4	0.5	30.0

Chinese	12.6	13.6	6.6	9.3	0.8	27.1	4.9	0.1	25.1
Mixed	15.9	27.0	10.3	5.5	2.6	13.6	4.1	0.3	20.8
Other	13.1	16.9	7.2	6.9	2.6	13.2	5.3	0.5	34.3
Unclassified	20.5	24.4	11.7	6.4	3.4	10.8	4.3	0.2	18.4
EAL	9.3	16.3	7.6	10.0	2.7	15.7	7.3	0.4	30.5
Not EAL	19.5	26.3	11.9	6.0	4.8	10.4	4.6	0.1	16.4
SEN	12.9	21.3	9.4	6.9	3.5	12.0	6.1	0.4	27.6
SEN statement	17.8	20.6	9.7	6.4	3.5	10.5	6.2	0.4	24.8
Not SEN	18.2	25.0	11.3	6.6	4.6	11.1	5.0	0.2	18.0
5+ GCSE	18.8	25.4	11.5	6.5	4.6	10.8	4.8	0.1	17.3
Not 5+ GCSE	7.9	18.5	8.3	7.3	3.5	14.9	7.3	0.6	31.7
Parental HE	64.4	54.3	37.1	20.6	22.2	22.4	12.5	15.3	31.0
No parental HE	20.4	27.7	42.8	58.2	56.4	54.9	67.3	68.9	43.1
Not known	15.1	18.0	20.1	21.2	21.4	22.8	20.2	15.8	25.9
POLAR 1	5.7	8.9	9.8	11.6	13.4	15.8	20.1	23.1	12.2
POLAR 2	11.0	14.9	15.8	17.8	19.3	19.8	22.3	22.2	17.1
POLAR 3	17.3	20.2	20.6	22.1	22.6	22.6	23.6	23.6	22.7
POLAR 4	26.2	25.1	24.5	23.2	23.0	21.7	19.0	17.8	23.5
POLAR 5	39.7	30.9	29.3	25.3	21.7	20.2	15.0	13.3	24.5
Overall	17.9	24.8	11.2	6.6	4.5	11.2	5.0	0.2	18.5

Note: this data only concerns students in the 2006 KS4 cohort entering HE up to 2011/12
Note 5+ GCSE A*-C includes English and maths and is based on GCSE or equivalent

There is a link between occupational class and the level of deprivation where a student lived before HE (Table 3). Students in all occupational groups make good value-added progress in KS4, but there is a clearer pattern of occupational class differentiation in terms of KS5 attainment – precisely the qualifications needed for entry to HE. The students unclassified in terms of occupational class have lower attainment than average but are not as disadvantaged as those in the long-term unemployed category.

Table 3 – Occupational class characteristics of students in HE, 2006 KS4 cohort, England

	Higher managerial & professional	Lower managerial & professional	Intermediate	Small employers & own account workers	Lower supervisory & technical	Semi-routine	Routine	Never worked & long-term unemployed	Not classified	Overall
IDACI score	0.11	0.12	0.15	0.19	0.16	0.22	0.24	0.33	0.22	0.17
KS3 points	40.2	39.1	39.1	37.6	38.4	37.5	37.1	34.1	36.9	38.5
KS4 entries	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.6	10.7	10.8
KS4 points	391.2	378.2	377.8	365.4	370.4	361.7	357.6	323.1	356.3	372.2
KS3-KS4 CVA	12.2	12.8	12.6	16.1	14.3	14.8	17.2	19.7	16.5	14.1
KS5 points	885.0	833.8	826.6	781.2	795.2	774.1	763.0	667.4	759.4	813.4
N	35,653	49,347	22,366	13,138	9,004	22,431	10,085	360	37,518	199,902

Parental education

Students disadvantaged in terms of FSM and EAL are less likely to have parents who attended HE, and this is part of the reason why parental education is a possible contextual indicator (Table 4). However, as with many such indicators, it is the students whose parental education is unknown who appear the most disadvantaged. This indicator also does not pick up SEN students. Black students are currently more likely than other students to have parents with HE. This means that using lack of parental HE as a contextual indicator could reduce the chances of Black students. This is likely to be a distortion created by using an indicator only currently available for those applying to HE.

Table 4 – Parental education of students in HE, 2006 KS4 cohort, England

	Parental HE	Not parental	Not	N

		HE	known/refused	
Living in care 2006	20.7	44.7	34.6	450
Not living in care 2006	40.1	39.3	20.6	201,980
FSM-eligible 2006	17.5	56.0	26.5	15,714
Not FSM-eligible 2006	41.9	37.9	20.2	186,716
Male	40.0	36.8	23.2	92,599
Female	40.0	41.4	18.6	109,831
White ethnicity	41.7	38.8	19.5	156,117
Asian ethnicity	25.5	50.2	24.3	21,394
Black ethnicity	43.3	29.3	27.4	10,652
Chinese ethnicity	25.9	46.6	27.5	1,696
Mixed ethnicity	44.6	33.3	22.1	5,360
Other ethnicity	37.7	35.3	27.0	2,590
Unclassified ethnicity	42.7	34.8	22.5	4,621
EAL 2006	28.6	46.1	25.3	31,146
Not EAL 2006	42.1	38.1	19.8	171,284
SEN 2006	35.9	38.6	25.5	11,766
SEN with statement 2006	39.3	35.0	25.7	1,548
Not SEN 2006	40.3	39.4	20.3	190,664
5+ GCSE A*-C + English/maths	41.2	39.1	19.7	185,190
Not 5+ GCSE A*-C +English/maths	27.7	41.0	31.3	17,240
Higher managerial & professional	28.6	9.3	25.9	17.8
Lower managerial & professional	33.3	17.4	43.3	24.7
Intermediate occupations	10.3	12.1	22.2	11.2
Small employers & own account	3.4	9.7	13.7	6.6
Lower supervisory & technical	2.5	6.4	9.7	4.4
Semi-routine occupations	6.2	15.6	25.3	11.2
Routine occupations	1.6	8.6	10.0	5.0
Never worked/long-term unemployed	0.1	0.3	0.3	0.2
Not classified	14.0	20.5	49.5	
POLAR 1	7.1	14.6	22.3	10.8
POLAR 2	12.7	19.3	33.5	16.1
POLAR 3	18.7	22.6	44.2	20.9
POLAR 4	25.6	22.2	48.1	24.0
POLAR 5	35.9	21.3	51.9	28.2
Overall	40.0	39.3	20.7	202,430

Students from families with parental university education tend to live in less disadvantaged areas. This may reflect, to some extent, the economic advantage of attending HE. Parental education is not strongly related to school attainment or progress up to KS4 for these eventual HE students (Table 5). The big difference comes at KS5. Again, those whose parental education is unknown have the lowest attainment.

Table 5 – Parental education of students in HE, 2006 KS4 cohort, England

	Parental HE	Not parental HE	Not known/refused	Overall
IDACI score	0.14	0.20	0.19	0.17
KS3 average points	39.57	37.91	37.43	38.48
KS4 entries	10.78	10.83	10.68	10.78
KS4 capped points	383.57	367.08	358.90	371.99
KS3-KS4 CVA progress	+13.06	+15.46	+13.60	+14.12
KS5 total points	857.09	786.91	770.93	812.18
N	77,054	74,545	38,215	189,864

Low participation neighbourhoods

POLAR is based on a measure of local HE participation. POLAR 1 areas are in the lowest participation quintile, and POLAR 5 the highest. As with IDACI (Gorard et al. 2017), the POLAR quintiles are linked to other indicators of disadvantage (Table 6). However, the link among those attending HE is not strong, and most disadvantaged students do not come from the most disadvantaged or low participation areas.

Table 6 – POLAR region of students in HE, 2006 KS4 cohort, England

	POLAR 1	POLAR 2	POLAR 3	POLAR 4	POLAR 5	N
Living in care 2006	12.9	17.1	24.7	21.8	23.4	449
Not living in care 2006	10.8	16.1	20.9	24.0	28.2	201,631
FSM-eligible 2006	15.4	19.5	28.5	20.9	15.7	15,672
Not FSM-eligible 2006	10.5	15.8	20.3	24.2	29.3	186,408
Male	10.3	15.7	20.6	24.1	29.3	92,441
Female	11.3	16.4	21.1	23.9	27.3	109,639
White ethnicity	11.7	16.2	19.6	24.0	28.5	155,839
Asian ethnicity	6.2	16.5	23.3	23.1	30.8	21,366
Black ethnicity	9.4	14.4	34.0	25.3	16.9	10,633
Chinese ethnicity	11.8	15.9	24.5	22.3	25.5	1,691
Mixed ethnicity	10.3	15.3	21.0	23.8	29.6	5,350
Other ethnicity	6.3	10.4	23.5	25.3	34.4	2,584
Unclassified ethnicity	9.5	16.0	19.4	25.6	29.5	4,617
EAL 2006	7.5	15.3	25.8	23.5	27.8	31,095
Not EAL 2006	11.5	16.2	20.0	24.1	28.3	170,985
SEN 2006	11.6	15.8	22.4	23.7	26.5	11,741
SEN with statement 2006	10.0	16.8	20.2	23.3	29.8	1,544
Not SEN 2006	10.8	16.1	20.8	24.0	28.3	190,339
5+ GCSE A*-C + English/maths	10.6	15.9	20.5	24.1	28.9	184,880
Not 5+ GCSE A*-C +E/m	13.7	17.8	24.6	22.8	20.9	17,200
Higher managerial/professional	9.5	12.2	14.8	19.5	25.1	17.8
Lower managerial & professional	20.4	22.9	23.8	25.8	27.0	24.7
Intermediate occupations	10.2	11.0	11.0	11.4	11.6	11.2
Small employers	7.1	7.3	7.0	6.4	5.9	6.6
Lower supervisory & technical	5.6	5.4	4.9	4.3	3.5	4.5
Semi-routine occupations	16.4	13.8	12.2	10.1	8.0	11.2
Routine occupations	9.4	7.0	5.7	4.0	2.7	5.0
Long-term unemployed	0.4	0.2	0.2	0.1	0.1	0.2
Not classified	21.2	20.0	20.4	18.3	16.2	18.8
Parental HE	26.3	31.5	35.7	42.7	51.0	40.0
Not parental HE	53.0	47.2	42.5	36.5	29.7	39.3
Not known/refused	20.6	21.3	21.8	20.8	19.3	20.6
Overall	10.8	16.1	20.9	24.0	28.2	202,080

POLAR and IDACI scores are clearly linked to some extent. Unlike parental education, school attainment and progress is linked to where students live (Table 7). But to some extent this is a tautology. HE entrants are more qualified than average, and more HE entrants come, by definition, from areas with higher HE participation.

Table 7 – POLAR regions of students in HE, 2006 KS4 cohort, England

	POLAR 1	POLAR 2	POLAR 3	POLAR 4	POLAR 5	Overall
IDACI score	0.29	0.21	0.20	0.15	0.10	0.17
KS3 average points	37.4	37.9	38.0	38.7	39.4	38.5

KS4 entries	11.0	10.94	10.8	10.7	10.7	10.8
KS4 capped points	359.4	365.5	367.1	374.2	382.3	372.0
KS3-KS4 CVA progress	+20.1	+16.2	+14.3	+12.8	+11.6	+14.1
KS5 total points	766.7	785.3	794.0	822.6	848.3	812.1
N	21,837	32,364	42,086	47,543	55,973	201,385

In conclusion, the nature of the indicators only available for those applying to university, and the level of missing data even among this group, means that none of the HESA characteristics are better than those from NPD. The only candidate worth pursuing further is POLAR, which could be available for each school cohort and has the least missing data.

Progressing to HE

The paper now turns to the differential characteristics of all students in one age cohort who reached certain milestones – continuing to Key Stage 5, gaining minimum qualifications at KS5 (defined as 300+ QCA points), entering higher education, and achieving a 2.1 or better in their degree (where their degree has such classifications). This section starts looking at the variables from NPD that are, in theory, available for all students.

Table 8 shows the decreasing proportion of the KS4 cohort continuing to each phase via KS5 and HE. This decrease happens for students with each indicator of possible disadvantage, but sometimes to a different extent. The biggest gaps appear in KS5 - with students living in care, with statements of SEN, and not reaching the level 2 threshold at KS4, especially under-represented. Neither of the latter two groups are currently targets for widening participation, which remains largely about the 'usual suspects'.

Table 8 – Percentage of pupil characteristics at each stage of post-16 education to HE, 2006 KS4 cohort, England

	Entered KS5	Achieved EE+ or equivalent	Entered HE	2:1 or first	N
Living in care 2006	15.71	11.21	10.29	1.92	4,372
Not living in care 2006	52.57	45.90	38.08	15.15	590,390
FSM-eligible 2006	31.01	25.16	20.02	5.28	78,504
Not FSM-eligible 2006	55.53	48.76	36.17	16.53	516,258
Male	47.81	41.12	30.59	12.05	302,709
Female	56.94	50.34	37.60	18.16	292,053
White ethnicity	50.81	44.38	31.26	14.92	499,356
Asian ethnicity	66.97	58.97	56.94	18.61	37,573
Black ethnicity	57.06	48.87	48.44	11.15	21,988
Chinese ethnicity	83.93	78.29	72.28	35.06	2,253
Mixed ethnicity	54.63	47.37	40.02	15.22	13,393
Other ethnicity	60.72	51.76	51.22	15.01	5,056
Unclassified ethnicity	48.25	41.43	30.42	12.94	15,143
EAL 2006	62.45	54.27	52.39	16.38	59,445
Not EAL 2006	51.17	44.69	31.20	14.90	535,317
SEN 2006	18.78	15.08	10.81	2.88	108,801
SEN with statement 2006	10.71	8.54	6.43	1.87	24,062
Not SEN 2006	59.80	52.49	39.23	17.77	485,961
5+ GCSE A*-C with Eng /ma	79.83	71.16	54.34	25.66	340,820
Not 5+GCSE A*-C with Eng/ma	15.35	11.44	6.79	0.81	253,327
Overall	52.30	45.65	34.04	15.05	594,762

Note: full data on all independent schools not available
Note: EAL includes all not known to have English as first language

Those students entering HE are predictably higher qualified than average having started out with higher test scores, and made more progress at school (Table 9).

Table 9 – Mean scores for pupils at each stage of post-16 education to HE, 2006 KS4 cohort, England

	All	Not entered KS5	Entered KS5	Achieved EE+ or equivalent	Not entered HE	Entered HE	2:1 or first
IDACI score	0.21	0.25	0.17	0.17	0.23	0.17	0.14
KS3 average points	33.70	29.48	37.43	37.79	31.19	38.48	40.00
KS4 entries	9.72	8.61	10.73	10.76	9.17	10.78	10.89
KS4 capped points	291.63	218.62	358.10	363.67	250.12	371.99	392.96
KS3-KS4 CVA progress	+1.27	-13.04	+13.85	+14.64	-5.52	+14.12	+30.10
KS5 total points	347.58	5.52	659.62	751.71	133.88	761.76	889.37
N	594,762	283,727	311,035	271,504	392,332	202,430	89,504

Note: EE+ or equivalent is based on total KS5 points, and so probably over-estimates those reaching minimum entry threshold

Note: HE outcomes are for those known to have a classified first degree within four years of completing KS5

Turning now to the variables only available for those entering HE, the direction of differences are as expected. However, there is not that much difference in the qualified HE participation rates by occupational group, parental education or POLAR (Table 10). This is because the overwhelming majority (92%) of students with minimum KS5 qualifications attend HE, regardless of prior attainment and SES background. Those with unknown occupation or parental education have the most substantial deviation below 92%. These SES and other differences become more marked for those whose degree outcome is known.

Table 10 – Percentage of student characteristics in HE, 2006 KS4 cohort, England

	Achieved EE+ or equivalent	2:1 or first	N
Higher managerial & professional	96.1	52.98	35,653
Lower managerial & professional	94.3	48.07	49,347
Intermediate occupations	94.2	47.51	22,366
Small employers & own account workers	92.6	41.95	13,138
Lower supervisory & technical occupations	93.6	43.54	9,004
Semi-routine occupations	90.8	38.67	22,431
Routine occupations	89.6	36.46	10,085
Never worked & long-term unemployed	78.6	18.89	360
Not classified by occupational class	88.8	35.97	37,518
Parental HE	94.3	49.21	81019
Not parental HE	92.6	42.75	79,567
Parental education unknown	89.8	37.33	41,844
POLAR 1	90.4	36.79	21,925
POLAR 2	91.5	40.68	32,467
POLAR 3	92.0	41.88	42,220
POLAR 4	93.3	46.20	48,472
POLAR 5	94.3	49.12	56,996
Overall	91.6	44.22	202,430

Note: this data is only available for students entering HE

Note: 160 cases are missing POLAR scores. Further cases are missing all relevant data.

Predicting continuation to KS5

Putting the variables together, it is possible to use prior attainment and all of the background variables to model whether a student continues to KS5 or not. This is done here rather differently to usual because the concern to see how unbalanced admission to KS5 and beyond is, once prior attainment has been accounted for. Therefore, prior attainment is entered into the model before SES and other factors. It is clear that the best predictors of KS5 participation are the various indicators of prior attainment (Table 11). Once these are accounted for, the students in different categories of possible contextual variables participate to roughly the same extent. Around 53% of KS4 students continue to KS5, and so an attempt to predict whether a large group of students would continue to KS5 or not would be correct around 53% of the time just by chance. Adding their KS3 prior attainment would increase the accuracy to 77%, and so on. Student background, in this way of reckoning, only contributes a further 0.3%.

Table 11 – Percentage of variation in attending KS5 explained by each step

Step	Percentage predicted correctly
0: Base	53.1
1: KS3 attainment	77.1
2: KS4 attainment	83.0
3: Student background (context)	83.3

To the extent allowed by the model, poorer students, and those living in care or with SEN are marginally less likely to continue to KS5. But this is not true for EAL and ethnic minority students who are actually over-represented in KS5 given their qualifications (Table 12).

Table 12 – Coefficients for variables in each step

Variable	Step 1 odds	Step 2 odds	Step 3 odds
KS3 average points	1.31	0.99	1.01
KS4 entries		0.85	0.86
KS4 capped points		1.02	1.02
Number of AA*		1.17	1.15
Number of passes A*-C		1.17	1.17
Female (vs male)			1.02
In care (vs not)			0.65
FSM-eligible (vs not)			0.88
IDACI score			0.42
EAL (vs not)			1.67
SEN (vs not)			0.86
Other ethnicity (vs White)			2.04
Asian (vs White)			2.41
Black (vs White)			3.24
Chinese (vs White)			2.94
Mixed (vs White)			1.56
Unclassified (vs White)			1.05

Predicting continuation to HE

A similar pattern appears when the same kind of model is created for continuation to HE. Only around 33% of students continue to HE. Most of the variation can again be explained by prior attainment. However, the overall model is less accurate, and prior attainment only adds 9.6%. There is a slightly larger 'role' (1.8%) for student background here (Table 13).

Table 13 – Percentage of variation in attending HE explained by each step

Step	Percentage predicted correctly
0: Base	66.7
1: KS3 attainment	69.4
2: KS4 attainment	72.7
3: KS5 attainment	76.3
4: Student background (context)	78.1

Clearly, those with higher prior attainment are more likely to attend HE. Again ethnic minority (of all categories) and EAL students are considerably over-represented in HE, while males and those living in care are under-represented. Poor students and those living in poorer areas appear to participate in almost direct proportion to their earlier qualifications (Table 14).

Table 14 – Coefficients for variables in each step

Variable	Step 1 odds	Step 2 odds	Step 3 odds	Step 4 odds
KS3 average points	1.18	0.99	0.98	1.03
KS4 entries		0.90	0.93	0.93
KS4 capped points		1.01	1.01	1.01
Number of AA*		1.21	1.08	1.05
Number of passes A*-C		1.09	1.06	1.06
KS5 total points			1.004	1.004
Female (vs male)				0.87
In care (vs not)				0.80
FSM-eligible (vs not)				0.98
IDACI score				0.98
EAL (vs not)				1.99
SEN (vs not)				0.72
Other ethnicity (v White)				3.42
Asian (vs White)				3.83
Black (vs White)				5.02
Chinese (vs White)				3.53
Mixed (vs White)				2.04
Unclassified (vs White)				1.21

Predicting 2:1 or first in HE

Unlike the last two sections, analysis of degree outcomes is only possible with the minority of students who do eventually attend HE. Predicting whether a student gains a first or 2.1 is harder than the previous steps, partly because not all degrees are classified, and partly because so much other data is missing or unclear. But again, once prior attainment is accounted for, there is little or no difference between students of different backgrounds (Table 15). Around 47% of students in HE for whom there is a result obtain a 2.1 classification or better (meaning 53% do not). Their attainment before HE adds a further 12.5% to the accuracy of prediction, and their contextual background only adds a further 0.4%. Students are gaining HE results in almost direct proportion to their prior attainment and largely unrelated to their background.

Table 15 – Percentage of variation in gaining 2.1 or better explained by each step

Step	Percentage predicted correctly
0: Base	53.2
1: KS3 attainment	60.5
2: KS4 attainment	64.4

3: KS5 attainment	65.5
4: Student background (school context)	65.9
5: Student background (HE context)	65.9

Insofar as background is a factor, then the situation is different to mere attendance at HE (above). Now the outcomes for ethnic minorities reverse, with all groups doing slightly worse than the White majority, as do EAL students (Table 16). To some extent, of course, this balances the situation for entry to HE.

Table 16 – Coefficients for variables in each step

Variable	Step 1 odds	Step 2 odds	Step 3 odds	Step 4 odds	Step 5: odds
KS3 average points	1.13	0.98	0.98	0.97	0.97
KS4 entries		0.86	0.86	0.88	0.88
KS4 capped points		1.01	1.01	1.01	1.01
Number of AA*		1.03	1.00	1.004	1.003
Number of passes A*-C		1.13	1.13	1.12	1.12
KS5 total points			1.002	1.001	1.001
Female (vs male)				1.26	1.26
In care (vs not)				0.57	0.59
FSM-eligible (vs not)				0.89	0.91
IDACI score				0.60	0.67
EAL (vs not)				0.96	0.96
SEN (vs not)				0.93	0.93
Other ethnicity (vs White)				0.71	0.70
Asian (vs White)				0.78	0.78
Black (vs White)				0.69	0.68
Chinese (vs White)				0.93	0.95
Mixed (vs White)				0.83	0.83
Unclassified (vs White)				0.90	0.90
Higher managerial professional					1.15
Lower managerial & professional					1.16
Intermediate occupations					1.14
Small employers & own account workers					1.09
Lower supervisory & technical					1.06
Semi-routine occupations					1.03
Routine occupations (vs unclassified)					0.99
Never worked & long-term unemployed					0.63
Parental HE (vs refused)					1.10
Not parental HE					1.16
Parental education unknown					1.04
POLAR 1 (vs 5)					0.91
POLAR 2					0.96
POLAR 3					0.98
POLAR 4					1.01

Type of university attended

There is an undoubted difference in perceived prestige, and so value (for some), between HEIs in the UK. Perhaps as much as attending HE or not at the traditional age, it is as important to consider which HEI is attended. The number of students in each HEI is too small for appropriate analysis (several HEIs have fewer than 10 students per cohort). The analysis here is based on self-declared groups of

universities, although a considerable number of HEIs of all types and prestige have no such group. There are differences in the prior attainment of students across the groups, with the most qualified attending Russell Group HEIs (Table 17).

Table 17 – Average attainment of students by university group, 2006 KS4 cohort, England

	Russell Group	University Alliance	Guild HE	1994 Group	Million+ Group	Not in a group	Unclassified	Overall
IDACI score	0.13	0.18	0.15	0.15	0.21	0.18	0.17	0.17
KS3 average points	42.2	37.3	37.4	40.3	35.9	37.9	39.4	38.5
KS4 entries	11.0	10.7	10.6	10.8	10.7	10.7	11.1	10.8
KS4 capped points	417.4	356.9	356.4	393.9	341.3	366.5	375.5	372.0
KS3-KS4 CVA progress	+17.0	+12.9	+12.4	+14.3	+13.2	+13.6	13.2	+14.1
KS5 total points	1018.2	727.6	747.5	903.3	628.1	788.6	805.4	812.2
N	38,667	47,314	5,713	13,128	26,459	56,097	2,486	202,430

And this difference in attainment is reflected in the type of students attending – with fewer poor students or those living in care in Russell Group Universities (Table 18).

Table 18 – Characteristics of students by university group, 2006 KS4 cohort, England

	Russell Group	University Alliance	Guild HE	1994 Group	Million+ Group	Not in a group	Unclassified	N
Living in care 2006	10.0	23.3	2.4	6.2	27.1	29.8	1.1	450
Not living in care 2006	19.6	24.9	3.0	6.7	14.7	29.8	1.3	201,980
FSM-eligible 2006	9.6	27.3	2.1	4.4	24.2	31.8	0.6	15,714
Not FSM-eligible 2006	20.4	24.7	3.1	6.9	14.0	29.6	1.3	186,716
Male	19.9	26.1	4.0	6.9	14.3	28.3	1.3	92,599
Female	19.3	23.9	3.1	6.4	15.1	30.9	1.3	109,831
White ethnicity	20.9	24.9	3.4	6.9	13.5	28.9	1.4	156,117
Asian ethnicity	15.5	25.3	1.4	5.2	19.1	33.3	0.3	21394
Black ethnicity	7.6	25.4	1.7	6.1	24.9	33.5	0.8	10652
Chinese ethnicity	29.7	21.3	1.2	8.7	9.7	28.2	1.1	1,696
Mixed ethnicity	18.5	25.0	2.8	6.8	15.7	30.5	0.6	5,360
Other ethnicity	17.1	25.8	1.8	6.6	16.1	32.3	0.4	2590
Unclassified ethnicity	20.1	23.7	3.4	7.4	11.8	32.7	0.8	4,621
EAL 2006	14.4	25.4	1.5	5.6	19.5	33.0	0.4	31,146
Not EAL 2006	20.5	24.8	3.3	6.9	13.9	29.2	1.3	171,284
SEN 2006	9.5	26.1	3.1	4.8	22.3	33.3	0.8	11,766
SEN with statement 2006	9.6	23.9	3.6	5.2	22.3	34.0	1.3	1,548
Not SEN 2006	20.2	24.8	3.0	6.8	14.3	29.5	1.2	190,664
5+ GCSE A*-C + Eng/maths	21.1	24.7	3.0	7.1	13.3	29.5	1.3	185,190
Not 5+ GCSE A*-C +Eng/ma	3.3	27.5	3.7	2.3	30.1	32.3	0.6	17,240
Higher managerial/professional	30.1	20.3	2.7	8.0	9.3	28.3	1.1	35653
Lower managerial/professional	22.4	23.9	3.3	7.4	12.5	29.3	1.2	49347
Intermediate occupations	21.3	24.5	2.9	7.1	12.4	30.5	1.3	22366
Small employers/own account	14.7	27.5	4.1	5.8	15.6	31.0	1.1	13138
Lower supervisory & technical	14.6	28.1	3.5	6.0	14.7	31.4	1.6	9004
Semi-routine occupations	14.4	28.7	3.0	5.5	17.5	29.5	1.2	22431
Routine occupations	11.4	27.5	3.3	5.0	19.1	32.1	1.5	10085
Long-term unemployed	3.6	22.5	2.2	3.9	18.9	48.9	0.0	360
Not classified	13.9	26.3	2.7	5.8	20.4	29.8	1.1	37518
POLAR 1	11.7	29.8	3.4	4.8	18.6	29.4	2.1	21925
POLAR 2	14.1	28.8	3.3	5.9	17.8	28.7	1.3	32467
POLAR 3	14.1	28.8	3.3	5.9	17.8	28.7	1.3	42220

POLAR 4	20.5	24.0	3.0	7.4	13.7	30.1	1.1	48472
POLAR 5	27.2	21.3	2.7	7.3	11.0	29.6	0.9	56996
Parental HE	26.6	21.3	2.7	7.6	11.5	29.1	1.1	81,019
No parental HE	15.4	27.2	3.2	6.0	16.6	30.3	1.3	79,569
Don't know	9.1	26.9	3.5	3.9	20.3	33.3	2.8	17,242
Refused	17.3	27.7	3.4	7.6	15.4	27.7	0.9	24,602
Overall	19.6	24.9	3.0	6.7	14.7	29.8	1.3	202,430

Conclusion

Most of the variables about student background available in HESA are incomplete to such an extent that they should not be used for contextualised admissions, and the NPD dataset is a more useful source for student background not least because it includes data on those students not progressing beyond KS4. Even those variables with reasonable coverage in HESA data such as occupational group or parental education have considerable missing data and suffer from two further defects. They are self-reported and so un-validated. And they apply only to students applying for HE. We have no idea about the occupation or education of the parents of the majority of each age cohort who do not apply to HE. The only feasible indicator is POLAR which is not itself self-reported, and has low missing data, but it has the defect of all such aggregate measures of not being about the individuals themselves.

The overwhelming majority of students with appropriate KS5 qualifications continue to HE, and they do so largely without systematic differences in their background or family characteristics. The stratification of HE *is* almost entirely the stratification of pre-university attainment. Therefore, where contextualised admissions are used it is not because similarly qualified students with different backgrounds are being treated differently on entry to HE. It can only be because the prior qualifications of students are deemed unfair. In this case, it is pertinent to consider whether we should use qualifications in this way at all (Gorard et al. 2007).

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